

### REMARKS/ARGUMENTS

The Examiner is thanked for the final Office Action mailed October 28, 2008. The status of the application is as follows:

- Claims 1-20 are pending, and claim 14 has been amended herein;
- Claims 2-4 and 16 are objected to for depending on a rejected base claim;
- Claims 14 are objected to for informalities;
- Claims 1, 9-11 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Flohr et al. (US 6,381,487);
- Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flohr et al. in view of Rasche et al. (WO02/103639 A2);
- Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flohr et al. in view of Taguchi et al. ("High temporal resolution for multislice helical computed tomography", 2000, Medical Physics, volume. 27, number 5, pages 861-872);
- Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flohr et al. in view of Bruder et al. (US 2003/0072419);
- Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flohr et al. in view of Hsieh (US 6,529,575);
- Claims 14-15 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drummond et al. (US 6,628,743 B1) in view of Okerlund et al. (US 6,526,117 B1) and in further view of Breeuwer (US 2002/0136438);
- Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drummond et al. in view of Okerlund et al. and Breeuwer and in further view of Brown ("A Survey of Image Registration Techniques", 1992, ACM Computing Surveys, volume 24, number 4, pages 325-376); and
- Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grass et al. ("Automatic Phase Point Determination for High-Resolution Cardiac CT Reconstruction", 1 December 2003, RSNA 2003, Abstract code E08-462) in view of Breeuwer.

The objections and rejections are discussed below.

**Allowable Subject Matter**

The Examiner is thanked for indicating that applicants' argument with respect to claim 2 is persuasive and that the 35 U.S.C. 103(a) rejection of claim 2 and claims 3-4 and 16, which depend therefrom, has been withdrawn.

**The Objection to Claim 14**

Claim 14 is objected to for informalities. In particular, claim 14 is objected to for depending on itself. Claim 14 has been amended herein to depend from claim 1. Accordingly, this objection is moot and should be withdrawn.

**The Rejection of Claims 1, 9-11 and 13 under 35 U.S.C. 102(b)**

Claims 1, 9-11 and 13 stand rejected under 35 U.S.C. 102(b) as being anticipated by Flohr et al. This rejection should be withdrawn because Flohr et al. does not teach each and every element as set forth in the subject claims and, therefore, does not anticipate claims 1, 9-11 and 13.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). MPEP §2131.

Independent **claim 1** recites, *inter alia*, reconstruction of a computer tomography image of the object from the measured values, wherein only measured values whose acquisition times lie within *the periods* in time intervals are used, which are *so determined that a similarity measure applied to intermediate images* of a same subregion of the object is minimized, wherein *different intermediate images are reconstructed using measured values from time intervals from different periods*. As such, the reconstruction is performed with data from periods that are determined from images generated with data from time intervals from different time periods.

The Office asserts that Flohr et al. describes the above-noted claim aspects, citing column 2 lines 26-27, column 3 lines 59-67, column 4 lines 50-63, column 5 line 67 to column 6 line 7, and column 6 lines 56-60 to support this assertion. However, the cited sections of Flohr et al. do

not describe the above-noted claim aspects. Rather, the cited sections of Flohr et al. disclose determining a rest phase period for each heart cycle time period from images generated with data from a time interval of the single corresponding heart cycle time period.

More particularly, column 4, lines 50-63, and Figure 5 disclose determining a rest phase time period ( $[T_{B1}, T_{B2}]$ ) for a single particular heart cycle time period from images generated with data from a time interval ( $[T_{B1} - \Delta T_R, T_{B2} + \Delta T_R]$ ) within the single particular heart cycle time period ( $[T_{RR}]$ ). Column 5, line 67, to column 6, line 7, discloses that images from the same heart cycle time period with negligible differences are allocated to the same rest phase period for that heart cycle time period.

The remaining cited sections do not further discuss the relationship between the rest phase period and the heart cycle time period. More particularly, column 2, lines 26-27, discloses that only data acquired during a rest phase period is reconstructed. Similarly, column 3, lines 59-67, relates to reconstructing data from the rest phase period. Column 6, lines 56-60, relates to generating images of slices on a viewing monitor.

From the above, none of the cited sections of Flohr et al. describe determining rest phase periods for heart cycle time periods from images generated with data from time intervals from different heart cycle time periods. Again, Flohr et al. instead discloses determining a rest phase period ( $[T_{B1}, T_{B2}]$ ) for each heart cycle time period from images generated with data from a time interval ( $[T_{B1} - \Delta T_R, T_{B2} + \Delta T_R]$ ) of the respective heart cycle time period ( $[T_{RR}]$ ).

Accordingly, Flohr et al. does not anticipate claim 1, and the rejection of claim 1, and the claims that depend therefrom, should be withdrawn.

#### **The First Rejection of Claims 19 and 20 under 35 U.S.C. 103(a)**

Claims 19 and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Drummond et al. in view of Okerlund et al. and in further view of Breeuwer. This rejection should be withdrawn because the combination of Drummond et al., Okerlund et al. and Breeuwer does not make obvious the subject claims.

The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the

elements as claimed. *KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_\_\_ (2007). MPEP §2143.

Independent **claim 19** recites, *inter alia*, a movement-detection device that determines periods of periodic movement and a reconstructor that reconstructs an intermediate image for each period, wherein each image for each period is reconstructed with data from a time interval of the corresponding period, and the time interval is selected such that a similarity measure between two consecutive images for two different periods satisfies threshold criteria. The Office asserts that Okerlund et al. discloses, at column 10, line 49 to column 11, line 19, that the reconstruction time interval is selected such that a similarity measure between two consecutive images for two different periods ..., as recited in the subject claim. Applicants respectfully disagrees.

The cited section discusses steps 154, 156 and 158 in the method of Figure 8 of Okerlund et al. In step 152 of Figure 8, sets of 2D images are generated for each phase. In step 154, the sets of 2D images that most closely align with the desired phase location are selected as the working sets of images. At 156, the working sets of images are compared. At 158, substantially misregistered working sets of images, if any, are identified. At 160, substantially misregistered working sets of images are substituted with other sets of images that more closely register with the working sets of images.

Hence, the cited section of Okerlund et al. discloses substituting sets of images based on image registration and not selecting a reconstruction time interval such that a similarity measure between two consecutive images for two different periods ..., as required by claim 19. In view of the foregoing, applicants respectfully requests withdrawal of the rejection of claim 19.

Independent **claim 20** recites aspects similar to claim 19. Therefore, the rejection of claim 20 should be withdrawn for at least the reasons discussed above with respect to claim 19.

**The Second Rejection of Claims 19 and 20 under 35 U.S.C. 103(a)**

Claims 19 and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Grass et al. in view of Breeuwer. This rejection should be withdrawn because the combination of Grass et al. and Breeuwer does not make obvious the subject claims.

The Office asserts that the Abstract of Grass et al. discloses the reconstruction time interval is selected such that a similarity measure between two consecutive images for two different periods ..., as recited in claim 19. Applicants respectfully traverse this assertion.

The Abstract of Grass et al. states that motion maps are derived from low resolution volumetric data sets between consecutive phase points in the cardiac cycle, the low resolution volumetric data sets being reconstructed from retrospectively gated cardiac projections at several cardiac phases. The Abstract further states that similarity measures are used to generate the motion maps. The Abstract further states that stable cardiac phases are determined from the motion maps.

Thus, the cited section of Grass et al. discloses generating motion maps based on similarity measures and not selecting a reconstruction time interval such that a similarity measure between two consecutive images for two different periods ..., as recited in the subject claim. Therefore, the rejection of claim 19 should be withdrawn.

Independent **claim 20** recites aspects similar to claim 19. Thus, the rejection of claim 20 should be withdrawn for at least the reasons discussed above with respect to claim 19.

#### **Other Claims**

The claims not addressed above directly or indirectly depend from claim 1 and are allowable at least by virtue of the dependencies

Application No. 10/596,151  
Amdt Dated: December 17, 2008  
Reply to Office Action Dated: October 28, 2008

**Conclusion**

In view of the foregoing, it is submitted that the claims distinguish patentably and non-obviously over the prior art of record. An early indication of allowability is earnestly solicited.

Respectfully submitted,



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